Question 1

The objective of the application is to provide a method by which a user may input a list of integers and have them stored in ascending order. The system then returns them in ascending order, and then reverse order.

The system makes use of the '*List'* example program as a baseline, provided to us for usage during the AC52002 module, with expansion and changes made on points to allow for additional functionality. This additional functionality includes a more robust number input, a second pointer on each node (to allow for two relations on a node), and a method by which to transverse the list in reverse. At one point in the design, due to the << operator overload, it was set to reverse the pattern through stringstream manipulation with the reverse() function, however, it was later assumed that the intended purpose was to show the reverse transversal operating correctly, so this was changed to work in a less elegant manner. The insert and delete functions also had to be edited to accommodate for the additional pointer on a node.

Testing was done by inserting values that would be integer-only across a range, values that were not integers, in addition to composite values to ensure the filter was working as intended. This includes numbers that are one digit long, numbers which are more than one digit long, numbers with either plus or minus sign at the beginning. Any items not adhering to these checks are treated as invalid inputs. Test cases can be shown in the table below:

|  |  |  |
| --- | --- | --- |
| Entered value | Expected Result | Actual Result |
| <blank> | Invalid | Invalid |
| (for first operation) 0 | Close operation | Close operation |
| (for second operation) 0 | No value found | No value found |
| 1 | Valid | Valid |
| -1 | Valid | Valid |
| +1 | Valid | Valid |
| 100 | Valid | Valid |
| -100 | Valid | Valid |
| +100 | Valid | Valid |
| 1-1 | Invalid | Invalid |
| 1+1 | Invalid | Invalid |
| T | Invalid | Invalid |
| Test | Invalid | Invalid |
| 1T | Invalid | Invalid |
| 1Test | Invalid | Invalid |
| -1T | Invalid | Invalid |